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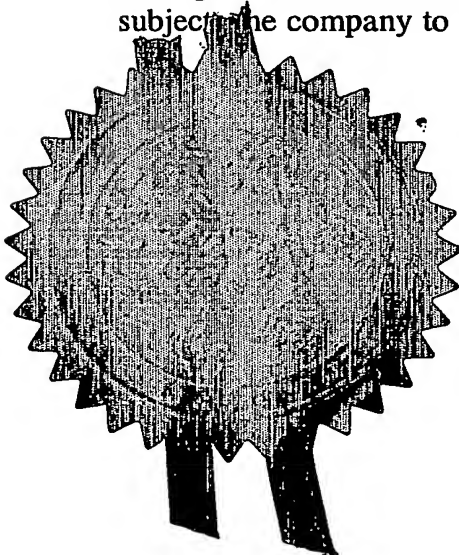
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Dated

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Request for grant of a patent

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Cardiff Road
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1. Your reference

11033P3 GB/AK

2. Patent application number

(The Patent Office will fill in this part)

0220250.5

31 AUG 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Reckitt Benckiser Inc
1655 Valley Road
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New Jersey 07474
UNITED STATES OF AMERICA

02SEP02 F744981-1 002903
P01/7700 0.00-0220250.5

Patents ADP number (*if you know it*)

07852247001

If the applicant is a corporate body, give the country/state of its incorporation

Delaware

4. Title of the invention

Improvements In or Relating to Organic Compositions

5. Name of your agent (*if you have one*)

John Crawford McKnight
Reckitt Benckiser plc
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"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

Patents ADP number (*if you know it*)

07799521001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country

Priority application number
(*if you know it*)

Date of filing
(*day / month / year*)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application
(*day / month / year*)

Date of filing
(*day / month / year*)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (*Answer 'Yes' if:*

Yes

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

Patents Form 1/77

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Continuation sheets of this form

Description	29
Claim(s)	6
Abstract	1
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10. If you are also filing any of the following, state how many against each item.

Priority documents	
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Statement of inventorship and right to grant of a patent (Patents Form 7/77)	
Request for preliminary examination and search (Patents Form 9/77)	One
Request for substantive examination (Patents Form 10/77)	One
Any other documents (please specify)	FS2

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

John C McKnight
John C McKnight

29 August 2002

12. Name and daytime telephone number of Person to contact in the United Kingdom

John C McKnight (01482) 583719

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IMPROVEMENTS IN OR RELATING TO ORGANIC COMPOSITIONS

5

The present invention relates to liquid detergent compositions, especially compositions which dissolve and disperse satisfactorily in water.

10

Background of the Invention

Liquid detergent compositions comprising surfactants are known. Such compositions can be used, for example, as hard surface cleaners, in either dilutable form or in ready to use form. In general, many surfactant compositions comprise a large amount of water.

15 For example, hand dishwashing compositions often contain up to 80 wt% water. Such compositions do not generally have any compatibility problems when being diluted with a large quantity of water.

20 For some purposes it is desirable to have detergent compositions which are anhydrous or substantially anhydrous. In some instances, when such compositions are anhydrous or substantially anhydrous, pre-measured doses can be prepared so that the user of the these compositions do not have to measure the appropriate amount of surfactant composition to use every time they wish to clean hard surfaces.

25 The present composition is suitable for use in a water-soluble container where the container is simply added to a large quantity of water and dissolves, releasing its contents. The favorable dissolution and dispersion properties of the composition of the present invention are particularly useful in this context.

30 Thus the present invention also provides a water-soluble container containing a composition as defined above.

The water-soluble container may comprise a thermoformed or injection molded water-soluble polymer. It may also simply comprise a water-soluble film. Such containers are described, for example, in EP-A-524,721, GB-A-2,244,258, WO 92/17,381 and WO 00/55,068.

5

The method of thermoforming the container is similar to the process described in WO 92/17382. A first poly (vinyl alcohol) ("PVOH") film is initially thermoformed to produce a non-planar sheet containing a pocket, such as a recess, which is able to retain the aqueous composition. The pocket is generally bounded by a flange, which is preferably substantially planar. The pocket may have internal barrier layers as described in, for example, WO 93/08095. The pocket is then filled with the aqueous composition, and a second PVOH film is placed on the flange and across the pocket. The second PVOH film may or may not be thermoformed. If the first film contains more than one pocket, the second film may be placed across all of the pockets for convenience. The pocket may be completely filled, or only partly filled, for example to leave an air space of from 2 to 20%, especially from 5 to 10%, of the volume of the container immediately after it is formed. Partial filling may reduce the risk of rupture of the container if it is subjected to shock and reduce the risk of leakage if the container is subjected to high temperatures.

20 The films are then sealed together, for example by heat sealing across the flange. Other methods of sealing the films together may be used, for example infra-red, radio frequency, ultrasonic, laser, solvent, vibration or spin welding. An adhesive such as an aqueous solution of PVOH may also be used. The seal desirably is also water-soluble.

25 For injection molding the containers of the present invention, the container or capsule generally comprises a receptacle part which holds the composition and a closure part, which may simply close the receptacle part or may itself have at least some receptacle function. The receptacle part preferably has side walls which terminate at their upper end in an outward flange in which the closure part is sealingly secured, especially if the closure part is in the form of a film. The securement may be by means of an adhesive but is preferably achieved by means of a seal, between the flange and the closure part. Heat sealing may be used or other methods such as infra-red, radio frequency, ultrasonic, laser, solvent, vibration or spin welding. An adhesive such as an aqueous

solution of PVOH or a cellulose ether may also be used. The seal is desirably also water-soluble.

5 The closure part may itself be injection molded or blow molded. Preferably, however, it is a plastic film secured over the receptacle part. The film may, for example, comprise PVOH or a cellulose ether such as HPMC or another water-soluble polymer.

10 The container walls have thicknesses such that the containers are rigid. For example, the outside walls and any inside walls which have been injection molded independently generally have a thickness of greater than $100\mu\text{m}$, for example greater than $150\mu\text{m}$ or greater than $200\mu\text{m}$, $300\mu\text{m}$ or $500\mu\text{m}$. Preferably, the closure part is of a thinner material than the receptacle part. Thus, typically, the closure part is of thickness in the range 10 to $200\mu\text{m}$, preferably 50 to $100\mu\text{m}$, and the wall thickness of the receptacle part is in the range 300 to $1500\mu\text{m}$, preferably 500 to $1000\mu\text{m}$. The closure part may, 15 however, also have a wall thickness of 300 to $1500\mu\text{m}$, such as 500 to $1000\mu\text{m}$.

20 Preferably, the closure part dissolves in water (at least to the extent of allowing the washing composition in the receptacle part to be dissolved by the water; and preferably completely) at 20°C in less than 3 minutes, preferably in less than 1 minute.

The receptacle part and the closure part could be of the same thickness but in this event the closure part may, for example, be of higher solubility than the receptacle part, in order to dissolve more quickly.

25 In the manufacturing method, the array, formed by injection molding, is fed to a filling zone, and all the receptacle parts are charged with the washing composition. A sheet of a water-soluble polymer such as PVOH or a cellulose ether may then be secured over the top of the array, to form the closure parts for all the receptacle parts of the array. The array may then be split up into the individual washing capsules, prior to packaging, 30 or it may be left as an array, for packaging, to be split by the user. Preferably, it is left as an array, for the user to break or tear off the individual washing capsules. Preferably, the array has a line of symmetry extending between capsules, and the two halves of the array are folded together, about that line of symmetry, so that closure parts are in face-to-face contact. This helps to protect the closure parts from any damage, between

factory and user. It will be appreciated that the closure parts are more prone to damage than the receptacle parts. Alternatively two identical arrays of washing capsules may be placed together with their closure parts in face-to-face contact, for packaging.

- 5 In all cases, the polymer is formed into a container or receptacle such as a pouch which can receive the composition, which is filled with the composition and then sealed, for example by heat sealing along the top of the container in vertical form-fill-processes or by laying a further sheet of water-soluble polymer or molded polymer on top of the container and sealing it to the body of the container, for example by heat sealing. Other
10 methods of sealing the films together may be used, for example infra-red, radio frequency, ultrasonic, laser, solvent, vibration or spin welding. An adhesive such as an aqueous solution of PVOH may also be used. The seal desirably is also water-soluble.

- Desirably the water-soluble polymer is PVOH. The PVOH may be partially or fully
15 alcoholized or hydrolyzed. For example, it may be from 40 to 100% preferably 70 to 92%, more preferably about 88%, alcoholized or hydrolyzed, polyvinyl acetate. When the polymer is in film form, the film may be cast, blown or extruded.

- The water-soluble polymer is generally cold water (20°C) soluble, but depending on its
20 chemical nature, for example the degree of hydrolysis of the PVOH, may be insoluble in cold water at 20°C, and only become soluble in warm water or hot water having a temperature of, for example, 30°C, 40°C, 50°C or even 60°C. It is preferable that the water soluble polymer is soluble in cold water.

- 25 The water soluble containers of the present invention find particular use where a unit-dosage form of the composition is required which is then diluted prior to use. Thus, for example, the composition may be useful as a hard surface cleaner (for example, floors, bathroom surfaces, windows) which is diluted prior to use. The water soluble container to be used for hard surface cleaners can take any shape, such as an envelope, sachet,
30 sphere, cylinder, cube or cuboid (i.e. a rectangular parallelepiped whose faces are not all equal) where the base is square, circular, triangular, or oval, but water soluble containers of rounded cuboid or cylindrical shape are preferred; rounded cuboid for use in, for example, a bucket of water and cylindrical when used as a refill for a trigger bottle. For the rounded cuboid water soluble container, the water soluble container can have

dimensions such as, for example, having a length of 1 to 5 cm, especially 3.5 to 4.5 cm, a width of 1.5 to 3.5 cm, especially 2 to 3 cm, and a height of 1 to 2 cm, especially 1.25 to 1.75 cm. The water-soluble container may hold, for example, from 10 to 40 g of the composition, especially from 15 to 25 g of the composition of the present composition.

- 5 For the cylindrical shape, the water soluble container diameter should be such that the water soluble container fits through the opening of a trigger bottle, generally about 2 cm. The length of the water soluble container can be about 1 to 8 cm. Such water soluble containers hold about 3 to about 25 g of composition. However, it should be understood that there is no theoretical limitation, in either size or shape, and what is suitable will
- 10 normally be decided upon the basis of the "dose" of the water soluble container's contents, the size of any aperture the water soluble container may have to pass through, and the available means of delivery.

- 15 In some embodiments, a single layer film for both the top and bottom the packet can be used or a laminate film of two or more layers of PVOH or other water soluble film can be used on either the top or bottom or on both top and bottom of the packet. For the cylindrical container, the film can also be single layer or a laminate of two or more layers of PVOH or other water soluble film.

20 Summary of the Invention

The present invention relates to a water soluble container containing a composition comprising:

- (a) at least one cationic surfactant having germicidal properties;
- 25 (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.;
- (d) optionally, at least one alkanolamine;
- (e) optionally, at least one polyethylene glycol; and
- (f) optionally, up to about 10% wt. of one or more conventional additives selected
- 30 from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water.

The containers include those compositions comprising

5

- (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant; and
- (c) at least one organic solvent having a solubility in water of at least 4%wt.

10 as well as those comprising

- (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
- (d) at least one alkanolamine

15

as well as those comprising

- (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
- (e) at least one polyethylene glycol

20

as well as those comprising

- (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
- (d) at least one alkanolamine; and
- (e) at least one polyethylene glycol

25

30

The water soluble container can comprise a thermoformed or injection molded water soluble polymer.

Also provided for is a method of preparing a cleaning solution comprising placing a water soluble container containing a composition comprising

(a) at least one cationic surfactant having germicidal properties;

(b) at least one non-ionic surfactant;

5 (c) at least one organic solvent having a solubility in water of at least 4%wt.;

(d) optionally, at least one alkanolamine;

(e) optionally, at least one polyethylene glycol; and

(f) optionally, up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents,
10 other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably
15 containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water

into an amount of water (for example, a bucket or trigger bottle) and allowing the water soluble container to dissolve. Thereafter, the cleaning solution is ready to use.

20 Also provided is a process for treating a surface comprising placing a water soluble container containing a composition comprising

(a) at least one cationic surfactant having germicidal properties;

(b) at least one non-ionic surfactant;

(c) at least one organic solvent having a solubility in water of at least 4%wt.;

25 (d) optionally, at least one alkanolamine;

(e) optionally, at least one polyethylene glycol; and

(f) optionally, up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH
30 buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water

5 into an amount of water, allowing the water soluble container to dissolve in the water to form a cleaning solution, and applying an effective amount of the solution to the surface in need of treatment.

Detailed Description of the Invention

10 The present invention relates to a water soluble container containing a composition comprising:

(a) at least one cationic surfactant having germicidal properties;

(b) at least one non-ionic surfactant;

(c) at least one organic solvent having a solubility in water of at least 4%wt.;

15 (d) optionally, at least one alkanolamine;

(e) optionally, at least one polyethylene glycol; and

(f) optionally, up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH
20 buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

25 wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water.

The containers include those compositions comprising

(a) at least one cationic surfactant having germicidal properties;

(b) at least one non-ionic surfactant; and

30 (c) at least one organic solvent having a solubility in water of at least 4%wt.

as well as those comprising

(a) at least one cationic surfactant having germicidal properties;

- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
- (d) at least one alkanolamine

5 as well as those comprising

- (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
- 10 (e) at least one polyethylene glycol

as well as those comprising

- (a) at least one cationic surfactant having germicidal properties;
- 15 (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
- (d) at least one alkanolamine; and
- (e) at least one polyethylene glycol

20 The water soluble container can comprise a thermoformed or injection molded water soluble polymer.

Also provided for is a method of preparing a cleaning solution comprising placing a water soluble container containing a composition comprising

- 25 (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.;
- (d) optionally, at least one alkanolamine;
- (e) optionally, at least one polyethylene glycol; and
- 30 (f) optionally, up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents,

hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water

into an amount of water (for example, a bucket or trigger bottle) and allowing the water soluble container to dissolve. Thereafter, the cleaning solution is ready to use.

Also provided is a process for treating a surface comprising placing a water soluble container containing a composition comprising

- (a) at least one cationic surfactant having germicidal properties;
- (b) at least one non-ionic surfactant;
- (c) at least one organic solvent having a solubility in water of at least 4%wt.;
- (d) optionally, at least one alkanolamine;
- (e) optionally, at least one polyethylene glycol; and
- (f) optionally, up to about 10% wt. of one or more conventional additives selected

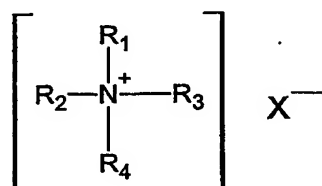
from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water

into an amount of water, allowing the water soluble container to dissolve in the water to form a cleaning solution, and applying an effective amount of the solution to the surface in need of treatment.

For the composition placed within the water soluble container, (a) at least one cationic surfactant having germicidal properties is present. Useful cationic surfactants having germicidal properties may be one or more of those described in, for example, *McCutcheon's Detergents and Emulsifiers*, North American and International Editions, 2001; *Kirk-Othmer, Encyclopedia of Chemical Technology*, 4th Ed., Vol. 23, pp. 478-541, the contents of which are herein incorporated by reference.

Examples of cationic surfactant compositions useful in the practice of the instant invention are those which provide a germicidal effect to the concentrate compositions, and especially preferred are quaternary ammonium compounds and salts thereof, which
 5 may be characterized by the general structural formula:

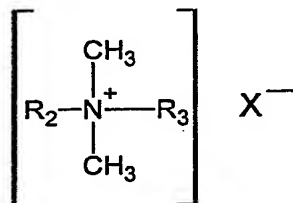


where at least one of R_1 , R_2 , R_3 and R_4 is an alkyl, aryl or alkylaryl substituent of from 6 to 26 carbon atoms, and the entire cation portion of the molecule has a molecular weight
 10 of at least 165. The alkyl substituents may be long-chain alkyl, long-chain alkoxyaryl, long-chain alkylaryl, halogen-substituted long-chain alkylaryl, long-chain alkylphenoxyalkyl, arylalkyl, etc. The remaining substituents on the nitrogen atoms other than the above mentioned alkyl substituents are hydrocarbons usually containing no more than 12 carbon atoms. The substituents R_1 , R_2 , R_3 and R_4 may be straight-chained
 15 or may be branched, but are preferably straight-chained, and may include one or more amide, ether or ester linkages. The counterion X may be any salt-forming anion which permits water solubility of the quaternary ammonium complex.

Examples of quaternary ammonium salts within the above description include the alkyl
 20 ammonium halides such as cetyl trimethyl ammonium bromide, alkyl aryl ammonium halides such as octadecyl dimethyl benzyl ammonium bromide, N-alkyl pyridinium halides such as N-cetyl pyridinium bromide, and the like. Other examples of quaternary ammonium salts include those in which the molecule contains either amide, ether or ester linkages such as octyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride,
 25 N-(laurylcocoaminoformylmethyl)-pyridinium chloride, and the like. Other very effective types of quaternary ammonium compounds which are useful as germicides include those in which the hydrophobic radical is characterized by a substituted aromatic nucleus as in the case of lauryloxyphenyltrimethyl ammonium chloride, cetylaminophenyltrimethyl ammonium methosulfate, dodecylphenyltrimethyl ammonium

methosulfate, dodecylphenyltrimethyl ammonium chloride, chlorinated dodecylbenzyltrimethyl ammonium chloride, and the like.

Further examples of quaternary ammonium compounds within the above description include those which have the structural formula:



wherein R_2 and R_3 are the same or different C_8 - C_{12} alkyl, or R_2 is C_{12} - C_{18} alkyl, C_8 - C_{18} alkylethoxy, C_8 - C_{18} alkylphenoxyethoxy and R_3 is benzyl, and X is a halide, for example chloride, bromide or iodide, or is a methosulfate or saccharinate anion. The alkyl groups recited in R_2 and R_3 may be straight-chained or branched, but are preferably substantially linear.

Useful quaternary germicides include compositions which include a single quaternary compound, as well as mixtures of two or more different quaternary compounds. Such useful quaternary compounds are available under the BARDAC®, BARQUAT®, HYAMINE®, CATIGENE, LONZABAC®, BTC®, ONYXIDE®, and PRAEPAGEN® trademarks, which are more fully described in, for example, *McCutcheon's Functional Materials*, North American and International Editions, 2001, and the respective product literature from the suppliers identified below. For example, BARDAC® 205M is described to be a liquid containing alkyl dimethyl benzyl ammonium chloride, octyl decyl dimethyl ammonium chloride; didecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (also available as 80% active (BARDAC® 208M)); described generally in *McCutcheon's* as a combination of alkyl dimethyl benzyl ammonium chloride and dialkyl dimethyl ammonium chloride); BARDAC® 2050 is described to be a combination of octyl decyl dimethyl ammonium chloride/didecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (also available as 80% active (BARDAC® 2080)); BARDAC® 2250 is described to be didecyl dimethyl ammonium chloride (50% active); BARDAC® LF (or BARDAC® LF-80),

described as being based on dioctyl dimethyl ammonium chloride (BARQUAT® MB-50, MX-50, OJ-50 (each 50% liquid) and MB-80 or MX-80 (each 80% liquid) are each described as an alkyl dimethyl benzyl ammonium chloride; BARDAC® 4250 and BARQUAT® 4250Z (each 50% active) or BARQUAT® 4280 and BARQUAT® 4280Z (each 80% active) are each described as alkyl dimethyl benzyl ammonium chloride/alkyl dimethyl ethyl benzyl ammonium chloride; and BARQUAT® MS-100 described as being a mixture of tetradecyl dimethyl benzyl ammonium chloride/dodecyl dimethyl benzyl ammonium chloride/hexadecyl dimethyl benzyl ammonium chloride (100% solid (powder)). Also, HYAMINE® 1622, described as diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride (available either as 100% actives or as a 50% actives solution); HYAMINE® 3500 (50% actives), described as alkyl dimethyl benzyl ammonium chloride (also available as 80% active (HYAMINE® 3500-80); and HYAMINE® 2389 described as being based on methyldodecylbenzyl ammonium chloride and/or methyldodecylxylene-bis-trimethyl ammonium chloride. (BARDAC®, BARQUAT® and HYAMINE® are presently commercially available from Lonza, Inc., Fairlawn, NJ). BTC® 50 NF (or BTC® 65 NF) is described to be alkyl dimethyl benzyl ammonium chloride (50% active); BTC® 99 is described as didecyl dimethyl ammonium chloride (50% active); BTC® 776 is described to be myristalkonium chloride (50% active); BTC® 818 is described as being octyl decyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (available also as 80% active (BTC® 818-80%)); BTC® 824 and BTC® 835 are each described as being of alkyl dimethyl benzyl ammonium chloride (each 50% active); BTC® 885 is described as a combination of BTC® 835 and BTC® 818 (50% active) (available also as 80% active (BTC® 888)); BTC® 1010 is described as didecyl dimethyl ammonium chloride (50% active) (also available as 80% active (BTC® 1010-80)); BTC® 2125 (or BTC® 2125 M) is described as alkyl dimethyl benzyl ammonium chloride and alkyl dimethyl ethylbenzyl ammonium chloride (each 50% active) (also available as 80% active (BTC® 2125-80 or BTC® 2125 M)); BTC® 2565 is described as alkyl dimethyl benzyl ammonium chlorides (50% active) (also available as 80% active (BTC® 2568)); BTC® 8248 (or BTC® 8358) is described as alkyl dimethyl benzyl ammonium chloride (80% active) (also available as 90% active (BTC® 8249)); ONYXIDE® 3300 is described as n-alkyl dimethyl benzyl ammonium saccharinate (95% active). CATIGENE series is described as mixtures of alkyl dimethyl benzyl ammonium chlorides/alkyl dimethyl ethyl benzyl ammonium chlorides/dialkyl dimethyl ammonium chlorides. (BTC®, ONYXIDE®,

and CATIGENE are presently commercially available from Stepan Company, Northfield, IL (CATIGENE from Stepan Europe)). Another example of a cationic surfactant is Praepagen HY, described as n-alkyl (C₁₂₋₁₄) dimethyl 2-hydroxyethyl ammonium chloride from Clariant. Another example of a cationic surfactant is Rewoquat CQ100 (Degussa), which is reported to be a blend of a quaternary ammonium compound and an ethoxylated fatty alcohol. Polymeric quaternary ammonium salts based on these monomeric structures are also considered desirable for the present invention. One example is POLYQUAT®, described as being a 2-butenyldimethyl ammonium chloride polymer.

The amount of at least one cationic surfactant having germicidal properties present in the inventive composition ranges from about 0.01 to about 20%wt. It should be noted that for the above cationic surfactants which are not supplied as 100 percent active, the cationic surfactant should be provided in a non-aqueous solvent or if supplied containing some water, the total amount of water present should be such that when placed within the composition of the present invention, the total amount of water does not exceed 1%wt.

For the present invention, (b) at least one nonionic surfactant is used in the composition. Nonlimiting examples of suitable nonionic surfactants which may be used in the present invention are as follows:

(1) The polyethylene oxide condensates of alkyl phenols. These compounds include the condensation products of alkyl phenols having an alkyl group containing from about 6 to 12 carbon atoms in either a straight chain or branched chain configuration with ethylene oxide, the ethylene oxide being present in an amount equal to 5 to 25 moles of ethylene oxide per mole of alkyl phenol. The alkyl substituent in such compounds can be derived, for example, from polymerized propylene, diisobutylene and the like. Examples of compounds of this type include nonyl phenol condensed with about 9.5 moles of ethylene oxide per mole of nonyl phenol; dodecylphenol condensed with about 12 moles of ethylene oxide per mole of phenol; dinonyl phenol condensed with about 15 moles of ethylene oxide per mole of phenol and diisooctyl phenol condensed with about 15 moles of ethylene oxide per mole of phenol.

(2) The condensation products of aliphatic alcohols with from about 1 to about 60 moles of ethylene oxide. The alkyl chain of the aliphatic alcohol can either be straight or branched, primary or secondary, and generally contains from about 8 to about 22 carbon atoms. Examples of such ethoxylated alcohols include the condensation product of myristyl alcohol condensed with about 10 moles of ethylene oxide per mole of alcohol and the condensation product of about 9 moles of ethylene oxide with coconut alcohol (a mixture of fatty alcohols with alkyl chains varying in length from about 10 to 14 carbon atoms). One example of such a nonionic surfactant is available as Empilan KM 50.

(3) Alkoxy block copolymers, and in particular, compounds based on ethoxy/propoxy block copolymers. Polymeric alkylene oxide block copolymers include nonionic surfactants in which the major portion of the molecule is made up of block polymeric C₂-C₄ alkylene oxides. Such nonionic surfactants, while preferably built up from an alkylene oxide chain starting group, and can have as a starting nucleus almost any active hydrogen containing group including, without limitation, amides, phenols, thiols and secondary alcohols.

Other nonionic surfactants containing the characteristic alkylene oxide blocks are those which may be generally represented by the formula (A):



where EO represents ethylene oxide,
PO represents propylene oxide,

y equals at least 15,

(EO)_{x+y} equals 20 to 50% of the total weight of said compounds, and, the total molecular weight is preferably in the range of about 2000 to 15,000. These surfactants are available under the PLURONIC tradename from BASF or Emulgen from Kao.

Another group of nonionic surfactants can be represented by the formula (B):



wherein R is an alkyl, aryl or aralkyl group, where the R group contains 1 to 20 carbon atoms, the weight percent of EO is within the range of 0 to 45% in one of the blocks a, b, and within the range of 60 to 100% in the other of the blocks a, b, and the total number of moles of combined EO and PO is in the range of 6 to 125 moles, with 1 to 50 moles in the PO rich block and 5 to 100 moles in the EO rich block.

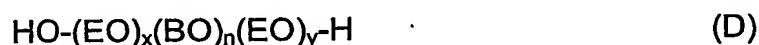
Further nonionic surfactants which in general are encompassed by Formula B include butoxy derivatives of propylene oxide/ethylene oxide block polymers having molecular weights within the range of about 2000-5000.

Still further nonionic surfactants containing polymeric butoxy (BO) groups can be represented by formula (C) as follows:



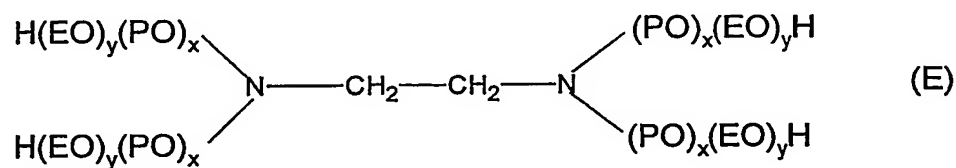
wherein R is an alkyl group containing 1 to 20 carbon atoms,
n is about 5-15 and x is about 5-15.

Also further nonionic block copolymer surfactants, which also include polymeric butoxy groups, are those which may be represented by the following formula (D):



wherein n is about 5-15, preferably about 15,
x is about 5-15, preferably about 15, and
y is about 5-15, preferably about 15.

Still further nonionic block copolymer surfactants include ethoxylated derivatives of propoxylated ethylene diamine, which may be represented by the following formula:



where (EO) represents ethoxy,
(PO) represents propoxy,

the amount of (PO)_x is such as to provide a molecular weight prior to ethoxylation of
5 about 300 to 7500, and the amount of (EO)_y is such as to provide about 20% to 90% of
the total weight of said compound.

Other examples of non-ionic surfactants include linear alcohol ethoxylates. The linear
alcohol ethoxylates which may be employed in the present invention are generally
10 include the C₆-C₁₅ straight chain alcohols which are ethoxylated with about 1 to 13
moles of ethylene oxide.

Examples include Alfonic® 810-4.5, which is described in product literature from Sasol
North America Inc. as having an average molecular weight of 356, an ethylene oxide
15 content of about 4.85 moles (about 60 wt.%), and an HLB of about 12; Alfonic® 810-2,
which is described in product literature from Sasol North America Inc. as having an
average molecular weight of 242, an ethylene oxide content of about 2.1 moles (about
40 wt.%), and an HLB of about 12; and Alfonic® 610-3.5, which is described in product
literature from Sasol North America Inc. as having an average molecular weight of 276,
20 an ethylene oxide content of about 3.1 moles (about 50 wt.%), and an HLB of 10.
Product literature from Sasol North America Inc. also identifies that the numbers in the
alcohol ethoxylate name designate the carbon chain length (numbers before the hyphen)
and the average moles of ethylene oxide (numbers after the hyphen) in the product.
These examples are typically C₆-C₁₁ straight-chain alcohols which are ethoxylated with
25 from about 3 to about 6 moles of ethylene oxide.

Other examples of ethoxylated alcohols include the Neodol® 91 series non-ionic
surfactants available from Shell Chemical Company which are described as C₉-C₁₁
ethoxylated alcohols. The Neodol® 91 series non-ionic surfactants of interest include
30 Neodol 91-2.5, Neodol 91-6, and Neodol 91-8. Neodol 91-2.5 has been described as
having about 2.5 ethoxy groups per molecule; Neodol 91-6 has been described as
having about 6 ethoxy groups per molecule; and Neodol 91-8 has been described as
having about 8 ethoxy groups per molecule.

Further examples of ethoxylated alcohols include the Rhodasurf® DA series non-ionic surfactants available from Rhodia which are described to be branched isodecyl alcohol ethoxylates. Rhodasurf DA-530 has been described as having 4 moles of ethoxylation and an HLB of 10.5; Rhodasurf DA-630 has been described as having 6 moles of ethoxylation with an HLB of 12.5; and Rhodasurf DA-639 is a 90% solution of DA-630.

Further examples of ethoxylated alcohols include those from Tomah Products (Milton, WI) under the Tomadol tradename with the formula $RO(CH_2CH_2O)_nH$ where R is the primary linear alcohol and n is the total number of moles of ethylene oxide. The ethoxylated alcohol series from Tomah include 91-2.5; 91-6; 91-8 - where R is linear C9/C10/C11 and n is 2.5, 6, or 8; 1-3; 1-5; 1-7; 1-73B; 1-9; - where R is linear C11 and n is 3, 5, 7 or 9; 23-1; 23-3; 23-5; 23-6.5 - where R is linear C12/C13 and n is 1, 3, 5, or 6.5; 25-3; 25-7; 25-9; 25-12 - where R is linear C12/C13 C14/C15 and n is 3, 7, 9, or 12; and 45-7; 45-13 - where R is linear C14/C15 and n is 7 or 13.

Another class of non-ionic surfactants include amine oxide compounds. Examples of amine oxide compounds may be defined as one or more of the following of the four general classes:

(1) Alkyl di (lower alkyl) amine oxides in which the alkyl group has about 6-24, and preferably 8-18 carbon atoms, and can be straight or branched chain, saturated or unsaturated. The lower alkyl groups include between 1 and 7 carbon atoms, but preferably each include 1 - 3 carbon atoms. Examples include octyl dimethyl amine oxide, lauryl dimethyl amine oxide, myristyl dimethyl amine oxide, and those in which the alkyl group is a mixture of different amine oxides, such as dimethyl cocoamine oxide, dimethyl (hydrogenated tallow) amine oxide, and myristyl/palmityl dimethyl amine oxide;

(2) Alkyl di (hydroxy lower alkyl) amine oxides in which the alkyl group has about 6-22, and preferably 8-18 carbon atoms, and can be straight or branched chain, saturated or unsaturated. Examples include bis-(2-hydroxyethyl) cocoamine oxide, bis-(2-hydroxyethyl) tallowamine oxide; and bis-(2-hydroxyethyl) stearylamine oxide;

(3) Alkylamidopropyl di(lower alkyl) amine oxides in which the alkyl group has about 10-20, and preferably 12-16 carbon atoms, and can be straight or branched chain, saturated or unsaturated. Examples are cocoamidopropyl dimethyl amine oxide and tallowamidopropyl dimethyl amine oxide; and

(4) Alkylmorpholine oxides in which the alkyl group has about 10-20, and preferably 12-16 carbon atoms, and can be straight or branched chain, saturated or unsaturated.

- 5 Two or more amine oxides may be used, wherein amine oxides of varying chains of the R_2 group are present. Examples of amine oxide compounds include N-alkyl dimethyl amine oxides, particularly octyl dimethyl amine oxides as well as lauryl dimethyl amine oxide. These amine oxide compounds are available as surfactants from McIntyre Group Ltd. under the tradename Mackamine® as well as from Stepan Co., under the
- 10 tradename Ammonyx®.

The at least one non-ionic surfactant is present in the inventive composition in an amount of from about 0.01 to about 40%wt.

- 15 The present invention, when present, contains at least one polyethylene glycol having a molecular weight from about 100 to about 4000 with those having a molecular weight of about 400 to 1000 being preferred and with those having a molecular weight of about 600 to 1000 being especially preferred. The polyethylene glycol, when present in the inventive compositions, is present in an amount of from about 2 to about 75 percent by
- 20 weight.

- Another component of the compositions of the present invention are at least one organic solvent having a solubility in water of at least 4%wt.. Examples of organic solvents which may be included in the inventive compositions include those which are at least
- 25 partially water-miscible such as alcohols (e.g., low molecular weight alcohols, such as, for example, ethanol, propanol, isopropanol, and the like), glycols (such as, for example, ethylene glycol, propylene glycol, hexylene glycol, and the like), water-miscible ethers (e.g. diethylene glycol diethyl ether, diethylene glycol dimethyl ether, propylene glycol dimethyl ether), water-miscible glycol ethers (having the formula R_a-R_b-OH , wherein R_a is an
- 30 alkoxy of 1 to 20 carbon atoms, or aryloxy of at least 6 carbon atoms, and R_b is an ether condensate of propylene glycol and/or ethylene glycol having from one to ten glycol monomer units. Examples include propylene glycol monomethyl ether, propylene glycol monoethyl ether, propylene glycol monopropyl ether, propylene glycol monobutyl ether, propylene glycol isobutyl ether, ethylene glycol monobutyl ether, dipropylene glycol

monomethyl ether, diethyleneglycol monobutyl ether (commercially available from Dow Chemical Co. (Midland, MI)), and lower esters of monoalkylethers of ethylene glycol or propylene glycol (e.g. propylene glycol monomethyl ether acetate (commercially available from Dow Chemical Co. (Midland, MI))). Mixtures of several organic solvents can also be used.

The amount of at least one organic solvent in the inventive compositions ranges from about 5 to about 97%wt.

Another component of the compositions of the present invention are (d) optionally, at least one alkanolamine and include such as, for example, mono-, di- and tri-alkanolamines. Examples of alkanolamines include, for example monoethanolamine, diethanolamine, triethanolamine and isopropanolamine. The alkanolamine constituent, when present, comprises from 0.01 to about 10.0% wt. of the inventive compositions.

The compositions according to the invention are useful in the disinfecting and/or cleaning of surfaces, especially hard surfaces in need of such treatment. These in particular include surfaces wherein the presence of gram positive and/or gram negative bacteria are suspected. In accordance with the present inventive process, cleaning and/or disinfecting of such surfaces comprises the steps of placing one or more water soluble containers which contains a composition of the present invention into a container containing an amount of water (for example, spray bottle with dip tube, a bucket) and allowing the container to dissolve, and then applying an effective amount of a composition as taught herein, by sponging, mopping, scrubbing, or spraying, to such a stained surface. Afterwards, the compositions are optionally but desirably wiped, scrubbed or otherwise physically contacted with the hard surface, and further optionally, may be subsequently rinsed from such a cleaned and disinfected hard surface.

Such a hard surface cleaning and disinfecting composition according to the invention is may be provided as a ready to use product which may be directly applied to a hard surface, but is desirably provided in a concentrated form intended to be diluted in water to form a cleaning composition therefrom.

By way of example, hard surfaces include surfaces composed of refractory materials such as: glazed and unglazed tile, porcelain, ceramics as well as stone including marble, granite, and other stones surfaces; glass; metals; plastics e.g. polyester, vinyl; fiberglass, Formica®, Corian®, wood, and other hard surfaces known to the industry.

- 5 Hard surfaces which are to be particularly denoted are lavatory fixtures such as shower stalls, bathtubs and bathing appliances (racks, shower doors, shower bars) toilets, bidets, wall and flooring surfaces especially those which include refractory materials and the like. Further hard surfaces which are to be denoted are those associated with kitchen environments and other environments associated with food preparation, including
- 10 cabinets and countertop surfaces as well as walls and floor surfaces especially those which include refractory materials, plastics, Formica®, Corian® and stone.

EXAMPLE FORMULATIONS

- 15 Preparation of Example Formulations:

Exemplary formulations illustrating certain preferred embodiments of the inventive compositions and described in more detail in Table 1 below were formulated generally by adding the components into a suitably sized vessel in no particular order and at room

20 temperature. If any of the components are solid, thick or gel-like at room temperature, they can be warmed to render them pourable liquids prior to addition to the vessel. Mixing of the constituents was achieved by the use of a mechanical stirrer with a small diameter propeller at the end of its rotating shaft. Mixing, which generally lasted from 5 minutes to 120 minutes was maintained until the particular exemplary formulation

25 appeared to be homogeneous. The exemplary compositions were readily pourable, and retained well mixed characteristics (i.e., stable mixtures) upon standing for extend periods.

Example formulations are listed on Table 1.

Table 1								
Component	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7	Ex. 8
PEG 600	59.60	48.6	24.60	37.60	72.60	54.45	71.73	30.73
Bardac 208M	6.40	6.40	6.40	6.40	6.40	6.32	6.32	6.32
Tomadol 45-7	7.00	7.00	7.00	7.00	7.00	6.92	6.92	6.92
IPA	15.00	8.50	15.00	2.00	2.00	1.98	1.98	8.40
Dowanol PnB	5.00	13.75	22.50	22.50	5.00	13.58	4.94	22.23
Dowanol PM	5.00	13.75	22.50	22.50	5.00	13.58	4.94	22.23
MEA	2.00	2.00	2.00	2.00	2.00	1.98	1.98	1.98
Fragrance						1.19	1.19	1.19
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 1 (cont'd)								
Component	Ex. 9	Ex. 10	Ex. 11	Ex. 12	Ex. 13	Ex. 14	Ex. 15	Ex. 16
PEG 600	58.89	56.59	71.73	65.30	65.30	66.30	47.30	28.30
Bardac 208M	6.32	6.32	6.32					
BTC 8358				12.50	12.50	12.50	12.50	12.50
Tomadol 45-7	6.92	6.92	6.92	7.00				
Tomadol 91-6					7.00	8.00	7.00	7.00
IPA	14.82	8.40	1.98	2.00	2.00	2.00	1.00	1.00
Dowanol DPnB				5.00	5.00	4.00	25.00	40.00
Dowanol PnB	4.94	9.30	4.94					
Dowanol DPM								5.00
Dowanol PM	4.94	9.30	4.94	5.00	5.00	4.00	1.00	
MEA	1.98	1.98	1.98	2.00	2.00	2.00	5.00	5.00
Fragrance	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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Table 1 (cont'd)								
Component	Ex. 17	Ex. 18	Ex. 19	Ex. 20	Ex. 21	Ex. 22	Ex. 23	Ex. 24
PEG 600	42.30	29.30	17.30	47.30	19.30	17.50	2.30	14.30
BTC 8358	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Tomadol 91-6	7.00	7.00	7.00	7.00	40.00	28.00	7.00	20.00
IPA	1.00		2.00	1.00	2.00	2.00		2.00
Dowanol DPnB	30.00	40.00	45.00	25.00	25.00	40.00	45.00	40.00
Dowanol DPM		5.00	5.00	1.00			30.00	5.00
Dowanol PM	1.00							
MEA	5.00	5.00	10.00	5.00			2.00	5.00
Fragrance	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 1 (cont'd)								
Component	Ex. 25	Ex. 26	Ex. 27	Ex. 28	Ex. 29	Ex. 30	Ex. 31	Ex. 32
PEG 600	24.30	27.30	32.30	25.30	9.30	10.38	23.30	25.30
BTC 8358	12.50	12.50	12.50	12.50	12.50	12.35	12.50	12.50
Ammonyx LO	7.00							
Alfonic 810-4.5						34.58		
Tomadol 91-6		14.00	14.00	7.00	35.00		14.00	14.00
IPA				1.00	2.00	1.98	2.00	
Dowanol DPnB	40.00	40.00	40.00	20.00	40.00	39.52	40.00	40.00
Dowanol DPM	5.00	5.00		2.50			5.00	5.00
MEA	10.00						2.00	2.00
Fragrance	1.20	1.20	1.20	1.20	1.20	1.19	1.20	1.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 1 (cont'd)								
Component	Ex. 33	Ex. 34	Ex. 35	Ex. 36	Ex. 37	Ex. 28	Ex. 39	Ex 40
PEG 600	25.00	73.49	75.10	27.00	72.00	28.22	28.22	
Bardac 208M		6.30	6.40					
BTC 8358	12.50			12.50	12.50	12.46	12.46	12.50
Tomadol 45-7		6.90	7.00			6.98		
Tomadol 91-6	14.00			14.00	14.00	6.98	13.96	14.00
Dowanol DPnB	40.00	4.93	5.00	40.00		21.93	21.93	62.00
Dowanol DPM	5.00	4.93	5.00	5.00		21.93	21.93	10.00
MEA	2.00	1.97						
Fragrance	1.20	1.18	1.20	1.20	1.20	1.20	1.20	1.20
Dye	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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Table 1 (cont'd)								
Component	Ex. 41	Ex. 42	Ex. 43	Ex. 44	Ex. 45	Ex. 46	Ex. 47	Ex. 48
BTC 8358	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Alfonic 810-4.5				14.00	14.00			14.00
Tomadol 91-6	14.00	14.00	14.00			14.00	14.00	
Dowanol DPnB	72.00			42.00	36.00	62.00	36.00	62.00
Dowanol PnB		62.00	72.00					
Dowanol DPM				30.00	36.00	10.00	36.00	10.00
Dowanol PM		10.00						
Fragrance	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Dye	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 1 (cont'd)				
Component	Ex. 49	Ex. 50	Ex. 51	Ex. 52
BTC 8358	12.50	12.50	12.50	1.482
Alfonic 810-4.5	14.00	14.00	14.00	1.50
Dowanol DPnB	36.00	72.00	67.00	20
Dowanol DPM	36.00		5.00	64.42
IPA				12
Fragrance	1.20	1.20	1.20	0.60
Dye	0.30	0.30	0.30	
Total	100.00	100.00	100.00	100.002

Table 1 (cont'd)							
Component	Ex. 53	Ex. 54	Ex. 55	Ex. 56	Ex. 57	Ex. 58	Ex. 59
Dowanol PnB	45	45	75		60	31.09	
Dowanol PnP						31.09	93.27
Dowanol DPnB				75	15		
Dowanol PM	30	30				31.09	
Barquat MS100	2.42	2.42	2.5	2.5	2.5		
Catigene T50						2.00	2.00
Emulgen MS-110	7						
Propylene glycol	12.38	12.38	9.18	9.18	9.18		
Neodol 91-8		7					
Neodol 91-6			7	7	7	3.08	3.08
MEA	2	2	2	2	2		
Fragrance	1.2	1.2	4.32	4.32	4.32	1.65	1.65

Table 1 (cont'd)								
Component	Ex. 60	Ex. 61	Ex. 62	Ex. 63	Ex. 64	Ex. 65	Ex. 66	Ex. 67
Dowanol PnB	82.25	75	45	45	48.85	49.45	48.85	48.85
Dowanol PM			30	30	30	30	30	30
Barquat MS100	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Emulgen MS-110				7	7	7		
Propylene glycol		7.25	7.25	7.25	7.25	7.25	4.25	5.45
Neodol 91-6	7	7	7				10	10
MEA	2	2	2	2	2	2	2	2
Fragrance	6.25	6.25	6.25	6.25	2.4	1.6	2.4	1.2

5.

Table 1 (cont'd)								
Component	Ex. 68	Ex. 69	Ex. 70	Ex. 71	Ex. 72	Ex. 73	Ex. 74	Ex. 75
BTC 8358	1.13	1.13	1.13	1.13	1.13	1.13		
BTC 65	7.17	7.17	7.17	7.17	7.17	7.17		
Catigene T-50							10.76	21.52
Ammonyx LO	16	16	16	16	16	16		
Dowanol DPnB	41.67	63.2	41.67	41.67	41.67	41.67		
Fragrance	12.5	12.5	12.5	12.5	12.5	12.5	10	20
Pluracol E600	21.53						50.79	16.58
Neodol 91-8			21.53					
Neodol 91-6							18.83	37.66
Hexylene Glycol				21.53				
Alfonic 810-4.5					25.7			
Alfonic 610-3.5						25.7		
% water							15	15

Table 1 (cont'd)								
Component	Ex. 76	Ex. 77	Ex. 78	Ex. 79	Ex. 80	Ex. 81	Ex. 82	Ex. 83
BTC 8358	1.35	1.35	6.46	6.46	6.46	6.46		
BTC 65	8.60	8.60					10.76	10.76
Ammonyx LO	15.70	13.57	21.43	19.71		13.34	12.03	
Praepagen HY		2.00		2.00	25.00		2.00	16.03
Dowanol DPnB	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Fragrance	10	10	10	10	10	10	10	10
Alfonic 810-4.5	14.35	14.48	12.11	11.83	8.54	15.9	15.21	13.21
% water	15	15	15	15	15	15	15	15

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Table 1 (cont'd)								
Component	Ex. 84	Ex. 85	Ex. 86	Ex. 87	Ex. 88	Ex. 89	Ex. 90	Ex. 91
BTC 8358	1.17	1.17	1.17	1.17				
BTC 65	7.45	7.45	7.45	7.45				
Barquat MS100					10.00	6.00	5.00	
Catigene T50								4.80
Ammonyx LO	15.70	15.70	15.70	15.70				
Monoethanolamine		1.00	5.00	10.00				
Dowanol DPnB	43.00	42.00	38.00	33.00				
Fragrance	8.68	8.68	8.68	8.68	9	6.00	4.50	
Dye								12.00
Pluracol E600					28.50	53.	64.25	86.445
Neodol 91-6					52.5	35.00	26.25	7.40
Bitrex (21.5%)								0.005
Alfonic 810-4.5	24.00	24.00	24.00	24.00				
% water					0	0	0	2.4

Table 1 (cont'd)								
Component	Ex. 92	Ex. 93	Ex. 94	Ex. 95	Ex. 96	Ex. 97	Ex. 98	Ex. 99
Catigene T50	4.80	4.80	4.00	4.00	3.20	4.00	4.00	4.00
Praepagen HY			1.00	3.00	1.00			
Fragrance	1.20	0.40	1.20	1.20	1.20	1.20	1.20	
Dye	0.15	0.15					0.15	
Pluracol E600	85.45	86.25	74.40	73.60	74.80	74.80	74.80	75.60
Neodol 91-6	8.40	8.40	7.00	7.00	7.00	7.00	7.00	7.00
% water	2.4	2.4	15	15	15	15	15	15

Table 1 (cont'd)						
Component	Ex. 100	Ex. 101	Ex. 102	Ex. 103	Ex. 104	Ex. 105
Catigene T50	8.00	8.00	8.00	8.00	8.00	8.00
Fragrance		2.40	0.80	2.40	2.40	2.40
Pluracol E600	67.00	64.60	66.20	70.60	50.60	25.60
Neodol 91-6	14.00	14.00	14.00	8.00	28.00	53.00
% water	15	15	15	15	15	15

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Table 1 (cont'd)						
Component	Ex. 106	Ex. 107	Ex. 108	Ex. 109	Ex. 110	Ex. 111
Catigene T50	8.00	2.00	2.00	2.00	2.00	3.00
Fragrance	2.40	0.60	0.60	0.60	0.60	0.90
Pluracol E600	12.60	76.40	38.40	19.40	10.40	72.10
Neodol 91-6	66.00	7.00	45.00	64.00	73.00	10.50
% water	15	15	15	15	15	15

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Table 1 (cont'd)						
Component	Ex. 112	Ex. 113	Ex. 114	Ex. 115	Ex. 116	Ex. 117
Catigene T50	3.00	3.00	3.00	4.00	4.00	4.00
Fragrance	0.90	0.90	0.90	1.20	1.20	1.20
Pluracol E600	36.10	18.00	9.00	67.80	33.80	17.80
Neodol 91-6	46.50	64.60	73.60	14.00	48.00	64.00
% water	15	15	15	15	15	15

Table 1 (cont'd)						
Component	Ex. 118	Ex. 119	Ex. 120	Ex. 121	Ex. 122	Ex. 123
Catigene T50	4.00	8.00	4.00	8.00	4.00	8.00
Fragrance	1.20	9.00	9.00	6.00	6.00	4.50
Pluracol E600	9.8	8.50	8.50	39.00	39.00	54.25
Neodol 91-6	72.00	63.50	65.50	41.00	43.00	29.75
% water	15	15	15	15	15	15

The above formulations are then placed into either thermoformed or injection molded water soluble containers using the methods described above. The water soluble containers showed no very little or no migration of liquid.

The components of the compositions set forth in the above Table 1 are described in Table 2 below. The indicated weight percentages are "as supplied" with the percent actives shown in parenthesis (unless otherwise noted, percent active is 100%).

Table 2	
Component	
PEG 600 or Pluracol E600	Polyethylene glycol (molecular weight 600) (BASF)
Bardac 208M	Mixture of N,N-dialkyl(C ₈ -C ₁₀)-N,N-dimethylammonium chloride and N-alkyl(C ₁₂ -C ₁₆)-N,N-methyl-N-benzylammonium chloride (80% active; Lonza)
Tomadol 45-7	linear C ₁₄₋₁₅ alcohol with 7 moles of ethylene oxide (Tomah)
Tomadol 91-6	linear C ₉₋₁₁ alcohol with 6 moles of ethylene oxide (Tomah)
IPA	Isopropanol
Dowanol PnB	Propylene Glycol n-Butyl Ether (Dow)
Dowanol PM	Propylene Glycol Methyl Ether (Dow)
MEA	Monoethanolamine
Fragrance	Fragrance
BTC 8358	N-alkyl (50% C ₁₄ ; 40% C ₁₂ ; 10% C ₁₆) dimethyl benzyl ammonium chloride (80% active; Stepan)
BTC 65	N-alkyl (67% C ₁₂ ; 25% C ₁₄ ; 7% C ₁₆ ; 1% C ₈ , C ₁₀ , C ₁₈) dimethyl benzyl ammonium chloride (50% active; Stepan)
Praepagen HY	N-alkyl (C ₁₂₋₁₄) dimethyl 2-hydroxyethyl ammonium chloride (Clariant)
Dowanol DPnB	Dipropylene Glycol n-Butyl Ether (Dow)
Dowanol DPM	Dipropylene Glycol Methyl Ether (Dow)
Hexylene Glycol	Hexylene glycol
Dye	Dye
Alfonic 810-4.5	C ₈ -C ₁₀ -alcohol polyethylene glycol ethers (4.5 EO) (Sasol North America Inc.)
Alfonic 610-3.5	C ₈ -C ₁₀ -alcohol polyethylene glycol ethers (3.5 EO) (Sasol North America Inc.)

Ammonyx LO	Lauryl dimethyl amine oxide (30% active; Stepan)
Emulgen MS-110	C ₁₂ -C ₁₄ (EO/PO/EO) nonionic surfactant (Kao)
Propylene glycol	Propylene glycol
Neodol 91-6	C ₉ -C ₁₁ ethoxylated alcohol having about 6 ethoxy groups per molecule (Shell)
Neodol 91-8	C ₉ -C ₁₁ ethoxylated alcohol having about 8 ethoxy groups per molecule (Shell)
Barquat-MS100	N-Alkyl(C ₁₂₋₁₆)-N,N-dimethyl-N-benzylammonium chloride (Lonza)
Catigene T50	Mixture of alkyl dimethyl benzyl ammonium chlorides (50% Active; Stepan Europe)

In use, a water soluble container can be placed into a spray bottle which uses a dip tube and trigger assembly to dispense a liquid, an amount of water (usually from about 16 to 32 ounces, depending upon the bottle and size of the water soluble container) is added to the bottle wherein the water soluble container starts to dissolve. The dip tube with trigger assembly is then reattached to the bottle and the solution formed therein is ready for use. The resulting solution can be used to treat a variety of surfaces, examples of which are described above. In addition, the water soluble container can also be used in conjunction with cleaning systems which comprise a handle, a cleaning head, and a fluid reservoir wherein the fluid reservoir is attached to the handle or to the cleaning head such that the fluid in the reservoir is dispensed onto a surface to be cleaned adjacent to the cleaning head. In use, the water-soluble container is placed into the fluid reservoir, the requisite amount of water is added to the reservoir and the water soluble container dissolves, releasing the composition contained therein to be released into the reservoir. The resulting solution is then ready to use in the cleaning system. Examples of cleaning systems include those described in, for example, WO 01/72195; WO 01/22861; WO 00/27271; WO 98/42246; DE 3940123; and United States Patent No. 5,888,006.

The compositions of the present invention will have good cleaning and disinfecting properties.

While the principles of the invention have been made clear in illustrative embodiments, there will be immediately obvious to those skilled in the art many modifications of structure, arrangement, proportions, the elements, materials, and components used in the practice of the invention, and otherwise, which are particularly adapted to specific environments and operative requirements without departing from those principles. The

appended claims are intended to cover and embrace any and all such modifications, with the limits only of the true purview, spirit and scope of the invention.

Claims:

1. A water soluble container containing a composition comprising:
 - (a) at least one cationic surfactant having germicidal properties;
 - 5 (b) at least one non-ionic surfactant;
 - (c) at least one organic solvent having a solubility in water of at least 4%wt.;
 - (d) optionally, at least one alkanolamine;
 - (e) optionally, at least one polyethylene glycol; and
 - (f) optionally, up to about 10% wt. of one or more conventional additives selected
- 10 from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;
- 15 wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water.
2. The container according to claim 1 which comprises a thermoformed or injection
- 20 molded water soluble polymer.
3. The container according to claim 2 wherein the water soluble polymer is poly(vinyl alcohol).
- 25 4. The container according to claim 1 wherein the composition comprises
 - (a) at least one cationic surfactant having germicidal properties;
 - (b) at least one non-ionic surfactant; and
 - (c) at least one organic solvent having a solubility in water of at least 4%wt.
- 30 5. The container according to claim 1 wherein the composition comprises
 - (a) at least one cationic surfactant having germicidal properties;
 - (b) at least one non-ionic surfactant;
 - (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
 - (d) at least one alkanolamine.

6. The container according to claim 1 wherein the composition comprises
(a) at least one cationic surfactant having germicidal properties;
(b) at least one non-ionic surfactant;
5 (c) at least one organic solvent having a solubility in water of at least 4%wt.; and
(e) at least one polyethylene glycol.
7. The container according to claim 1 wherein the composition comprises
(a) at least one cationic surfactant having germicidal properties;
10 (b) at least one non-ionic surfactant;
(c) at least one organic solvent having a solubility in water of at least 4%wt.;
(d) at least one alkanolamine; and
(e) at least one polyethylene glycol.
- 15 8. The container according to any one of claims 1 to 7 wherein the amount of (a) at least one cationic surfactant having germicidal properties is present in an amount of from about 0.01 to about 20 percent by weight.
9. The container according to any one of claims 1 to 8 wherein (b) at least one non-
20 ionic surfactant is present in an amount of from about 0.01 to about 40 percent by weight.
10. The container according to any one of claims 1 to 9 wherein (c) at least one organic solvent is present in an amount of from about 5 to about 97 percent by weight.
25
11. The container according to any one of claims 5 and 7 wherein the amount of (d) at least one alkanolamine is present in an amount of from about 0.01 to about 15 percent by weight.
- 30 12. The container according to any one of claims 6 and 7 wherein (e) at least one polyethylene glycol is present in an amount of from about 2 to about 75 percent by weight.
13. A water soluble container containing a composition comprising:

(a) at least one cationic surfactant having germicidal properties, said cationic surfactant being present in an amount of from about 0.01 to about 20 percent by weight;

(b) at least one non-ionic surfactant, said non-ionic surfactant being present in an amount of from about 0.01 to about 40 percent by weight;

5 (c) at least one organic solvent having a solubility in water of at least 4%wt., said organic solvent being present in an amount of from about 5 to about 97 percent by weight;

(d) optionally, at least one alkanolamine, said alkanolamine, when present, is present in an amount of from about 0.01 to about 15 percent by weight;

10 (e) optionally, at least one polyethylene glycol, said polyethylene glycol, when present, is present in an amount of from about 2 to about 75 percent by weight; and

(f) optionally, up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH
15 buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

20 wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water.

14. The container according to claim 13 which comprises a thermoformed or injection molded water soluble polymer.

25 15. The container according to claim 14 wherein the water soluble polymer is poly(vinyl alcohol).

16. The container according to claim 13 wherein the composition comprises:

30 (a) at least one cationic surfactant having germicidal properties present in an amount of from about 0.01 to about 20 percent by weight;

(b) at least one non-ionic surfactant present in an amount of from about 0.01 to about 40 percent by weight; and

(c) at least one organic solvent having a solubility in water of at least 4%wt. present in an amount of from about 5 to about 97 percent by weight.

17. The container according to claim 13 wherein the composition comprises:

(a) at least one cationic surfactant having germicidal properties present in an amount of from about 0.01 to about 20 percent by weight;

5 (b) at least one non-ionic surfactant present in an amount of from about 0.01 to about 40 percent by weight;

(c) at least one organic solvent having a solubility in water of at least 4%wt. present in an amount of from about 5 to about 97 percent by weight; and

10 (d) at least one alkanolamine present in an amount of from about 0.01 to about 15 percent by weight.

18. The container according to claim 10 wherein the composition comprises:

(a) at least one cationic surfactant having germicidal properties present in an amount of from about 0.01 to about 20 percent by weight;

15 (b) at least one non-ionic surfactant present in an amount of from about 0.01 to about 40 percent by weight;

(c) at least one organic solvent having a solubility in water of at least 4%wt. present in an amount of from about 5 to about 97 percent by weight; and

20 (e) at least one polyethylene glycol present in an amount of from about 2 to about 75 percent by weight.

19. The container according to claim 13 wherein the composition comprises:

(a) at least one cationic surfactant having germicidal properties present in an amount of from about 0.01 to about 20 percent by weight;

25 (b) at least one non-ionic surfactant present in an amount of from about 0.01 to about 40 percent by weight;

(c) at least one organic solvent having a solubility in water of at least 4%wt. present in an amount of from about 5 to about 97 percent by weight;

30 (d) at least one alkanolamine present in an amount of from about 0.01 to about 15 percent by weight; and

(e) at least one polyethylene glycol present in an amount of from about 2 to about 75 percent by weight.

20. The water-soluble containers of the present invention substantially represented by Ex. 1 to Ex. 123.

21. A method of preparing a cleaning solution comprising placing a water soluble container containing a composition comprising

(a) at least one cationic-surfactant having germicidal properties;

(b) at least one non-ionic surfactant;

(c) at least one organic solvent having a solubility in water of at least 4%wt.;

(d) optionally, at least one alkanolamine;

(e) optionally, at least one polyethylene glycol; and

(f) optionally, up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water

into an amount of water within a container, and allowing the container to dissolve.

22. A process for treating a surface comprising placing a water soluble container containing a composition comprising

(a) at least one cationic surfactant having germicidal properties;

(b) at least one non-ionic surfactant;

(c) at least one organic solvent having a solubility in water of at least 4%wt.;

(d) optionally, at least one alkanolamine;

(e) optionally, at least one polyethylene glycol; and

(f) optionally; up to about 10% wt. of one or more conventional additives selected from coloring agents, fragrances and fragrance solubilizers, viscosity modifying agents, other surfactants, other antimicrobial/germicidal agents, pH adjusting agents and pH buffers including organic and inorganic salts, optical brighteners, opacifying agents, hydrotropes, antifoaming agents, enzymes, anti-spotting agents, anti-oxidants, preservatives, and anti-corrosion agents;

wherein said composition contains no more than 20%wt. water, more preferably containing no more than 5%wt. water, and even more preferably containing no more than 1% wt. water

- 5 into an amount of water within a container, allowing the container to dissolve in the water to form a cleaning solution, and applying an effective amount of the solution to the surface in need of treatment.

Abstract

IMPROVEMENTS IN OR RELATING TO ORGANIC COMPOSITIONS

5 The invention relates to a water soluble container which contains a composition useful
-----for hard surface cleaning. The composition comprises at least one cationic surfactant -----
having germicidal properties, at least one non-ionic surfactant, at least one organic
solvent having a solubility in water of at least 4%wt., optionally at least one
alkanolamine; optionally, at least one polyethylene glycol; and optionally, conventional
10 additives, where the composition contains less than 20%wt. water, more preferably
containing no more than 5%wt. water, and even more preferably containing no more
than 1% wt. water. The water soluble containers can be made by thermoforming or
injection molding.

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